

CALIBRATION STANDARD REQUIREMENT

FOR A

DECADE RESISTOR

(6 DECADES, 1 OHM STEPS)

\* \* \* \* \*

PROCUREMENT PACKAGE

Prepared by: Naval Warfare Assessment Division  
Measurement Science Directorate  
Code MS-33  
Corona, CA 91718-5000

January 1996  
Encl (1)

CALIBRATION STANDARD REQUIREMENT FOR  
A DECADE RESISTOR  
(SIX DECADES, 1 OHM STEPS)

1. SCOPE

1.1 Scope. This requirement defines the mechanical, electrical, and electronic characteristics for an AC/DC Resistance Decade Box. This equipment is intended to be used by Navy personnel in shipboard and shorebase laboratories to calibrate electrical equipment such as thermometer bridge ohmmeters, and megaohmmeters. For the purpose of this requirement, the AC Resistance Decade Box shall be referred to as the DR.

2. APPLICABLE DOCUMENTS

2.1 Controlling Specifications. MIL-T-28800, "Military requirement, Test Equipment for use with Electrical and Electronic Equipment, General specification for", and all documents referenced therein of the issues in effect on the date of this solicitation shall form a part of this requirement.

3. REQUIREMENTS

3.1 General. The DR shall conform to the Type II, Class 5, Style E requirements as specified in MIL-T-28800 for Navy shipboard and shorebased equipment as modified below. The use of material restricted for Navy use shall be governed by MIL-T-28800.

3.1.1 Design and Construction. The DR design and construction shall meet the requirements of MIL-T-28800 for Type II equipment.

3.1.2 Power requirements. No power is required.

3.1.3 Dimension and Weight. Maximum dimensions shall not exceed 18 inches (46 cm) in width, 4 inches (10 cm) in height, and 5 inches (13 cm) in depth. The weight shall not exceed 9 pounds (4.4 kg).

3.2 Environmental Requirements. The DR shall meet the environmental requirements for a Type II, Class 5, Style E equipment with the deviations specified below.

3.2.1 Temperature and Humidity. The DR shall meet the conditions below:

	<u>Temperature((C)</u>	<u>Relative Humidity(%)</u>
Operating	10 to 30	95
	30 to 40	75
Non-operating	-40 to 70	Not controlled

3.2.2 Electromagnetic Compatibility. The electromagnetic compatibility requirements are not applicable.

3.3 Reliability. Type II reliability requirements are as specified in MIL-T-28800.

3.3.1 Calibration Interval. The DR shall have an 85% or greater probability of remaining within tolerances of all requirements at the end of a 12 month period.

3.4 Maintainability. The DR shall meet the Type II maintainability requirements as specified in MIL-T-28800 except the lowest discrete component shall be defined as a replaceable assembly. Certification time shall not exceed 60 minutes.

3.5 Performance Requirements. The DR shall provide the following capability as specified below.

3.5.1 Range. The DR shall have six decades with eleven step/ decade (0 to 10) for a total range of 0 to 1,111,110 ohms.

3.5.2 Uncertainty. The resistor's basic uncertainty shall be equal to or better than (0.01% of selected value +.002 ohms).

3.5.3 Temperature Coefficient. The temperature coefficient shall be a maximum of (10 ppm/(C above 100 ohms and (20 ppm/(C for 100 ohms and below

3.5.4 Maximum Current. The maximum current for each decade shall be indicated on each dial and shall be at least that given in the table below.

<u>Total Resistance</u> (Amps)	<u>Resistance/Step</u>	<u>Maximum Current</u>
10	1	0.8
100	10	0.250
1,000	100	0.08
10,000	1,000	0.023
100,000	10,000	0.007
1,000,000	100,000	0.0023

3.5.5 Switch Resistance. Switch resistance shall not exceed 0.0005 ohms.

3.5.6 Zero Inductance. The inductance shall not exceed 0.8 uH when all dials are set to the zero tolerance position.

3.5.7 Terminals. Two low-thermal-emf jack-top binding posts shall be provided with a third as a shield terminal. The spacing shall be the standard 3/4 inch. They will be located on the front panel.

3.5.8 Shorting Bar. A removable shorting bar shall be provided to connect the low terminal and the shield terminal.

3.6 Manual. At least two copies of an operation and maintenance manual shall be provided. The manual shall meet the requirements of MIL-M-7298.

3.6.1 Calibration Procedure. The manual shall include a calibration procedure in accordance with MIL-M-38793.

